

AERA Research Conference Grant Proposal

PBL in K-12 Research Conference

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ABSTRACT

Project based learning (PBL) has a long history, but recently there has been growing interest across the K-12 spectrum in the US and internationally. This is the result of perceived shortcomings in 21st century teaching and learning, and because theorists and developers have become more rigorous in their conceptualization of effective PBL use. PBL is now one of the most prevalent instructional innovations within the progressive K-12 reform movement, particularly among reform networks and smaller high school initiatives. Schools, districts, and sometimes entire states are implementing professional development initiatives, but without fail the most intense PBL adopters do not have a research mission and lack capacity. This includes reform networks and charter management organizations that have spent years and countless dollars creating PBL-friendly schools have no research staff or rely on part-time consultants. There are no systems in place to enable and accelerate meaningful investigations of pressing issues for research and practice. While there are a plethora of online resources to support PBL practitioners, none are intended to help researchers communicate or be productive. The AERA SIG for Problem Based Education (2012) – which includes medical and engineering school educators -- has seen a growing number of K-12 research papers, but the quality and scale of this work is not what it need to be. Our proposal is to build a coordinated effort to support research in K-12 settings by creating an online site for PBL in K-12 researchers and building a community of investigators who can share ideas and resources. We need to do a better job studying K-12 implementations of PBL if we hope to avoid implementation pitfalls and to foster improved knowledge and practice.

Proposed Dates:

April 10, 2013: International and national gathering one day prior to AERA

October 12, 2012: Indianapolis, IN

Ongoing: Building online resources and small local gatherings

CONFERENCE AT A GLANCE

We are proposing to support collaboration among PBL in K-12 researchers at different levels - a national and international gathering for AERA attendees accompanied by a shared online resources for worldwide use, a state-wide gathering in Indiana, and local gatherings for independent teams who are geographically co-located but not currently collaborating. Our planning process is transparent and we will welcome ideas for how to make the most of our efforts.

Location and Dates We propose to organize a large meeting of PBL researchers on April 10, 2013 in Atlanta (or one day before the 2013 AERA annual meeting), scheduled to avoid conflict with any other AERA meetings. Leading up to this meeting, starting in early Fall 2012, we propose to have a major regional gathering in Indiana, where there is critical mass of PBL sites and researchers. We will also support (with minimal expense) small local meetings to help catalyze collaboration and contributions from a wider range of perspectives prior to these meetings.

Size and Scope Participation in the conferences will be limited to 30 to increase the quality of interactions. We expect 30 people to attend our international gathering prior to AERA and 30 people to attend the Indiana gathering. There are also 10 people slated to attend a pan-Israel meeting, and several dozen appear ready to participate online or in other small local gatherings. Appendix A shows there are already 67 people with confirmed interest.

Organizers The proposal has been organized by *Jason Ravitz*, Director of Research at the Buck Institute for Education (BIE), a CA-based non-profit that provides research, products and services to schools, districts and states. He is also Chair of the AERA SIG on Problem Based Education (and a 2011 Outstanding Reviewer for AERJ-TLHD). Jason has been involved in major studies of teaching practices in the US, evaluations of large R&D projects and efforts to improve teaching and learning through the use of PBL. Mary English, a doctoral candidate in Educational Psychology and Learning and Instruction at George Mason University and a Senior Learning Analyst with Booz Allen Hamilton, is assisting him. She is conducting her dissertation on PBL implementation at the classroom level as well as the best practices for supporting student self-regulation in PBL. She has co-authored several publications, and has extensive professional experience in instructional systems design and media. A growing list of others has contributed to ideas in this proposal and has agreed to help provide leadership (Appendix D).

Statement of Objectives The conferences are part of a larger initiative to develop an online collaborative community of PBL researchers for the purpose of improving research methods, sharing ideas, and leveraging resources. The conferences will support the larger initiative by providing a venue for face-to-face networking, extensive dialogue on specific issues, presentations, and sharing of work. The objectives of the main conference are to 1) build on the ideas that started to take shape online; 2) help develop a common way of defining PBL in its various forms; 3) develop a list of research priorities for each topic; 4) develop a list of key methodological issues to be addressed and recommendations when possible; 5) obtain commitments from participants in each team to write specific research articles for publication in IJPBL or in a book; 6) define the way forward for each group and the group as a whole; and 7) explore creating a PBL in K-12 Dissertation Award committee. The local conferences will provide an opportunity for initiating dialogue, organizing the online space and inviting additional contributors into the effort.

A REVIEW OF PBL LITERATURE

PBL Defined PBL is a learner-centered, constructivist-based instructional approach that is designed to support deeper, more engaged learning. This approach uses “projects” as vehicles to encourage student motivation, contextualize content and concepts, and to provide a means for demonstrating and explaining what they have learned. The Buck Institute for Education (BIE) has put forth a widely-used definition of PBL as “a systematic teaching method that engages students in learning knowledge and skills through an extended inquiry process structured around complex, authentic (real-life) questions and carefully designed products and tasks” (2003, p. 4). Although there are subtle differences, this approach has much in common with problem-based or inquiry-based instruction (Barron & Darling-Hammond, 2008; Savery, 2006). In practice, “many educators will refer to the same activity interchangeably as ‘project-based’ or ‘problem-based’ learning, or simply ‘PBL’” (Mitchell et al., 2005, p. 40). What matters is the practices used, not the terminology. All of these approaches attempt to promote academic rigor while promoting “soft skills” such as critical thinking, communication and collaboration (e.g., Trilling & Hood, 1999). They often encourage students to be responsible and resourceful for their own learning, to solve open-ended problems, and usually to create and present artifacts as demonstrations of their learning. In PBL students conduct in-depth investigations, sometimes utilize technology, apply reasoning and self-management skills, create projects, synthesize information, lead presentations, and often work in groups.

PBL's Significance Politicians, business leaders, and educators are calling for school reforms that reflect the needs of society. President Obama, for example, has urged states to develop standards "that don't simply measure whether students can fill in a bubble on a test but whether they possess 21st century skills like problem-solving and critical thinking, entrepreneurship and creativity" (CNN, 2009). The Partnership for 21st Century Skills (2011) claims that a profound gap exists between the knowledge and skills that most students learn in school and the knowledge and skills they need in today's workplace (2011). Darling-Hammond (2008) states that the new demands of society cannot be met through passive, rote-oriented learning focused on basic skills and memorization of disconnected facts, while Wagner (2008) contends that the world has changed, while our schools have not, becoming obsolete.

In response to these calls for innovation, PBL has become a key pedagogy for the small high school movement, as reported by evaluators for the Bill & Melinda Gates Small Schools initiative. "Among the schools in this initiative that reported efforts to implement a common pedagogy across all classes, project-based learning (PBL) is the most commonly cited instructional strategy." (American Institutes for Research & SRI International, 2004, p. 65). Organizations that are helping advance PBL use include the Buck Institute for Education, the Center of Excellence in Leadership for Learning, Edutopia, Expeditionary Learning Schools (1999), Big Picture Schools, Apple (2011) and reform models like New Tech and High Tech High (Ravitz, 2009).

While few policy initiatives specifically endorse PBL by name, there are many initiatives (e.g., focused on small schools, youth development, technology integration, performance assessment, and 21st century skills) that have led to a wave of interest. An early Partnership for 21st century skills state, West Virginia, has made major investments in PBL (Ravitz, Hixson, English & Mergendoller, 2012; West Virginia Department of Education, 2008; Williamson, 2008). Another PBL-intensive state is Indiana, with over 1000 teachers receiving professional development in the last couple of years (Gillenwaters, 2009; Staff Reports, 2011; University of Indianapolis, 2010; Indiana University School of Education-Indianapolis, 2010; 2012). Further indication of interest in PBL is that the UTEACH program, a major pre-service STEM program that is extending to multiple campuses, has a full course about project based instruction (Petrosino, 2012). Outside the US there is also substantial interest in PBL, as reflected in Appendix A, on the world map shown on the Problem Based Education SIG (2012) web page, in convenings like Republic Polytechnic (2007) and in the letter of support we have received from Israel in Appendix D.

Challenges for teachers Like the implementation of other classroom innovations, implementation of PBL poses some challenges for educational systems. The more open-ended, dynamic, and student-centered format of PBL holds more complexity for teachers than does the direct transmission of knowledge, which is more prescriptive, linear, and teacher-directed (Darling-Hammond, 2008). Cohen (1988) notes that teachers who choose to implement PBL "must work harder, concentrate more, and embrace larger pedagogical responsibilities than if they only assigned text chapters and seatwork" (p. 255). Not only is PBL more complex, but classroom practices associated with it—including planning, classroom management, the roles of the teacher and students, the process of knowledge creation, and means of assessing student work—go against the grain of what most teachers learned in their pre-service programs, of how they learned themselves, and of what they have seen modeled (Ball & Cohen, 1999; Smith, 1996; Pedersen & Liu, 2003; Nelson & Harper, 2006). Additionally, accountability pressures related to high stakes tests have resulted in more emphasis on rote memorization and less emphasis on activities that involve more complex reasoning, such as projects and research papers (Koretz, Linn, Dunbar, & Shepard, 1991; Linn, 2000; Linn, Graue, & Sanders, 1990). T

Challenges for students Learners in PBL are expected to take responsibility for their learning and manage the learning process. To do this effectively, it is clear that students in the PBL environment must be able to motivate themselves, focus their efforts and attention appropriately, monitor and evaluate their progress, and seek help as needed. Blumenfeld et al. (1991) found that students in PBL needed to "be far more responsible for guiding and controlling their own activities and focusing their work on the creation of artifacts over a long period of time" (p. 379). According to Brush and Saye (2001), this shift in responsibility does not occur naturally or easily. Due to lack of experience and knowledge with self-directed learning, students may become confused or frustrated if they do not receive the support or guidance needed to be successful (Ertmer & Simons, 2006).

Impact of PBL Research suggests that PBL is not only aligned with information age skills, but also has a number of academic and other benefits. Many studies have reported positive changes in student motivation, attitude toward learning, critical thinking and problem-solving skills resulting from their participation in project-based learning (Bartscher, Gould, & Nutter, 1995; Peck, Peck, Sentz, & Zasa, 1998; Tretten & Zachariou, 1995). Others have emphasized PBL as a form of rigorous content delivery, finding improved cognitive outcomes for students, but no similar

gains in motivation and affective outcomes (Kanter & Konstantopoulos, 2010). The impact varies based on design and implementation approaches.

The measured impact of PBL also depends on the kinds of outcomes that are analyzed (Belland, French & Ertmer, 2008). For most important outcomes (with the exception of short-term concept learning), PBL appears to be as effective as traditional instructional approaches, and there are many studies that show PBL to be superior (Edutopia, 2001; Buck Institute for Education, 2009; Strobel & van Barneveld, 2008; Walker & Leary, 2008). Specifically, PBL type instruction has been shown at times to increase understanding of concepts and the ability to apply knowledge as measured by standardized tests of subject matter (e.g., Geier et al., 2008; Hickey, Kindred, Horwitz, & Christie, 1999; Mergendoller, Maxwell, & Bellisimo, 2007; Walker & Leary, 2008); to enable students to remember what they have learned longer and use that knowledge in new situations (e.g., Dochy, Segers, Van den Bossche, & Gijbels, 2003; Schwartz & Martin, 2004; Strobel & van Barneveld, 2008); to enable students to learn how to work in groups, solve problems, and communicate what they have learned (e.g., Cognition and Technology Group at Vanderbilt, 1992; Gallagher, Stepien, & Rosenthal, 1992; Hmelo, 1998); to improve attitudes and motivation (e.g., Boaler, 1997); and to be especially effective with lower achieving students (e.g., Geier et al., 2008; Hickey et al., 1999; Lynch, Kuipers, Pyke, & Szesze, 2005; Mergendoller et al., 2007). Recent groundbreaking studies using strong PBL designs, rigorous research methods and high quality assessments of learning include Finkelstein, et. al. (2010) and Boss, et. al. (2011).

ADDRESSING RESEARCH GAPS AND METHODOLOGICAL DILEMMAS

Methodological or Measurement Issues The conference will help address key methodological and measurement challenges for PBL that include developing and using theoretically sound frameworks for assessing PBL outcomes (Belland, French, & Ertmer, 2009); addressing wide variations in conceptualization of PBL and its implementation and establishing a common framework to study its effectiveness. We will address difficulties of studying PBL at scale including how to measure differences in implementation and create comparison studies that address school, teacher and student characteristics so that we can identify for whom and under what conditions PBL works best. Because the most substantial examples of PBL use are in schools that are radically altering many of their structures and philosophies at once, or integrating many new technologies, this raises additional challenges about how to control for school type and characteristics. There are also issues concerning how to control for teacher and student characteristics, and how to obtain and aggregate data across complex educational systems like districts. The group will share designs and measures that can help address these challenges.

Conference Outcomes and Benefits The conferences are part of a larger initiative to develop a collaborative PBL research community. Much of the ongoing work will be done online via a shared collaborative space, where contributors will post examples of research designs, validated instruments, completed research, and links to local initiatives. The proposed conferences will support the larger initiative by providing an opportunity for more extensive and in-depth interchange. The main conference outcomes include an overview and report summarizing key issues in PBL research in K-12, definitions used, etc. Groups will work to develop agreed upon research priorities and a list of methodological issues with recommendations or strategies to consider. When appropriate, we will produce large group consensus recommendations to guide future research (something graduate students and others could cite when proposing new studies). Where there is lack of agreement, we will use our time together to document diverse perspectives, (e.g., as part of our defining of PBL we might create Venn diagrams of projects vs. problems). During the later part of the day we will secure commitments to write articles or book chapters that build on our conversations, make plans for ongoing collaborative research and continued communication. Finally, we will explore whether there is interest in creating a PBL in K-12 dissertation award and how this might be accomplished.

Advancement of Emergent Areas PBL is not a new idea, but the idea of large-scale implementation of the pedagogy at the district- or state-wide level is new. Today's PBL is far more nuanced and complex than at any time in the past, with greater variation across established approaches, both within and outside different school wide reform models. Emerging areas of research we will address include use of new technologies for PBL, new assessments as part of Common Core, and growing interest in connecting in- and out-of school learning. Other major research areas that are emerging include strategies for blended, ongoing professional development, school change and leadership.

CONFERENCE ORGANIZATION

The collaborative PBL research group will be structured into teams based on specific research interests that are relevant across geographic boundaries. Each team will have a lead, who will be responsible for coordinating and

delegating activities, and presenting at the main conference. Lead people will facilitate discussions and contributions from attendees so that it builds on the advance work of the leads and organizers. The formation of teams has already begun, based on the data submitted through the participation application. Among those who have agreed to participate, we have asked certain individuals (see Appendix D) to take the lead facilitating discussions and collecting resources around specific content areas (e.g., pre-service education, teacher perceptions and motivation, student reactions to PBL, PBL in informal learning, scaling up PBL, etc.). We expect several more, including one focused on equity of PBL use and impacts for at-risk students.

The main conference, which will be held immediately prior to AERA 2013, will begin with an evening reception and will continue with a full day of presentations and working sessions. The presentations by leads will be brief and structured around pre-determined topics to provide a summary of their work and to highlight how this work fits into the online space we are creating and where more work is needed. Lunch will include time for networking and signing up for online account access, for those who have not yet done so. The afternoon will be allocated for teams to work through pre-determined issues, which they will share with the larger group. A reporter will take notes during large group sharing, will help document group work, and help prepare the final report with the organizers.

Agenda 8:00-9:00 Light breakfast, introductions & icebreaker. 9:00-12:00 Presentations by team leads with breaks for reflection. 12:00-1:00 Networking and lunch in groups to work on online spaces. 1:00 - 2:30. Working session 1. 2:30 - 4:00 Working session 2. 4:00 - 5:30 Working session 3. 5:30 - 6:00 Debrief and reflections 6:00 - 8:00 Dinner (optional). Working sessions (WS) will be done in teams. WS1-exploring differences in definitions of PBL and agreeing on over-arching research priorities; WS2-developing a list key methodological issues to be addressed with identification of strategies to consider or recommendations. WS3 - planning next steps and obtaining commitments for continued work (e.g., developing products and publications, establishing new collaborative projects, exploring continued funding possibilities and a vision for a PBL in K12 Dissertation Award).

Local Meetings Prior to the main conference event and the large meeting in Indiana there will be several small local gatherings (with minimal expenses). We will spend up to \$500 offering a "social incentive" (Dillman, 2000) of \$50-\$100 for convening researchers who are not already collaborating, i.e., from at least two different research projects or teams. Local participants will be instructed to use their time to contribute to the online space and to develop ideas for future collaboration. Local leads will set up and facilitate the meeting, helping to orient the participants to the main topic areas and showing participants how to register for the site and upload resources. These meetings are important because opportunities for local collaboration are rarely realized when cross-institution and cross-discipline sharing has not been explicitly funded. As noted by one of our leads Peg Ertmer, "Nobody finds time in their schedules to meet and talk about these things. This will provide the opportunity to set aside time to actually pull people together who are doing similar things and can benefit from each others work." Local meetings will include structured activities to produce products and resources that support the larger conference objectives. The benefit of getting people together to start working in advance of the larger meetings is well worth the minimal cost.

Indiana Indiana is a hub for this project and will have the only other large meeting besides the one just before AERA. There are several major initiatives underway that have already provided professional development to over a 1000 teachers. In addition, Indiana has invested heavily in starting up New Tech Network schools that focus on PBL use, and there are several major research centers at universities with independent PBL-related research agendas. We have decided that Indianapolis is the most central location to host meetings and have secured the leadership of the Center of Excellence in Leadership of Learning (CELL) at University of Indianapolis to help us arrange a hotel, a small reception the night before, and a meeting day that includes a light breakfast and lunch. In preparation for this meeting, institutional leads in Indiana will organize small planning sessions in Bloomington, Purdue, and Indianapolis to begin building the online space, preparing them to discuss their work using a common framework. We will share what we produce in Indiana online use what we learn to help shape the subsequent meeting at AERA.

Expected Participant Contributions In order to be a formal presenter, participants will have to propose a 15-20 minute talk on a major topic. Because we anticipate having to limit the size of the April meeting and because we want to assure participants have an established record of quality and relevant research, attendees will have to submit an application to attend. The application will solicit ideas and materials that are needed for the online space. Once accepted to attend, all attendees (including non-presenters) will provide a 1-2 page summary of their research for the online site and for distribution. These will use a common format aligned to the goals of the conference such as: a) definition of PBL; b) key research topics; c) methods used and methodological challenges; d) key findings; and e) implications and next steps. Those who attend local meetings will have an opportunity to produce these products in

advance of the conference. After the conference, these will be updated and combined into a report for distribution. Selected entries will be expanded into a book proposal and/or invited to submit articles to IJPBL.

Most participants have already started contributing by completing our survey instrument that asks for lists of existing links and resources and interests (see Ravitz & English, 2012). Those who have completed the survey have expressed interest in working on topics across a wide range of subjects and grade levels--7 in all subjects and grades (including pre-service); 7 in secondary all subjects; 5 in math in all grades, 12 focused on science in various grades, 6 on secondary social studies; 3 STEM, and 2 elementary. Some have already offered to contribute specific products including data collection instruments (e.g., surveys, observation tools and protocols, rubrics, etc.), published papers, and examples of curricula and classroom tools. Research methods they will present include experimental, survey, qualitative methods, and mixed methods. After the conference participants will complete an evaluation survey indicating if the process was useful, how helpful the products will be and how their experiences will support or enhance continued work on PBL research and new collaborations.

Dissemination of Results A number of dissemination vehicles will allow the results of the conference to be seen. Of the 48 who completed our initial survey, 26 have said they are “very interested” in shared publishing opportunities. Our plans for dissemination include -- a) A full report to AERA and potentially in the Interdisciplinary Journal for Problem Based Learning (IJPBL) followed by a strand of articles, (one or two per issue); b) a summary of the report on the BIE.ORG web site; c) a blog on Edutopia, which has a large PBL audience; d) a Twitter hashtag for researchers -- #pblresearch (in addition to using #pbl to reach practitioners, when appropriate); e) a book proposal; and f) a page on the SIG web site for K-12. Participants in the survey have also helped identify these organizations as potentially interested in helping to disseminate our findings: Edutopia; New Tech Network; High Tech High; Illinois Math and Science Academy; PBL Summer Institute at Ben Davis High School (Indiana); Association of Science Technology Centers; National Association of Research in Science Teaching; Computer Using Educators (CUE); International Society for Technology in Education (ISTE); American Association of Biology Teachers; iNACOL; SIG-IT; NCTM and SITE.

Participant Recruitment We started with a list of known PBL in K-12 researchers and asked them to complete a survey to confirm their interest, provide information about their work, and recommend others). The survey is available online (Ravitz & English, 2012). We contacted a cross-section of researchers of diverse topics related to PBL including leadership and school reform, performance assessment, technology integration, and teacher professional development. We included academics, research-oriented school leaders (e.g., from New Tech Network), consultants, and informal learning researchers (e.g., after-school or museums), as well as international scholars.

The first email invitations went to 35 people. Adding people they recommended we have now asked 80 people total to complete a survey of interest. So far we have received responses from 57 (a 71% response rate). Of these, 48 have confirmed they are conducting appropriate research and are interested in participating at some level (not necessarily attending in person). Based on talks with local leads the anticipated number of participants has grown to 67 (See Appendix A). We expect more than half to attend one of our two large meetings (with many from Indiana probably not making it to AERA), and the rest participating online or in local-regional settings. The group may grow to include a few high profile researchers who have expressed verbal interest, invitees who may still complete the survey (as well as the people they may add); and local gathering participants at sites yet to be defined. We also want to recruit, to the extent funds will allow, more international participants from countries with strong interest in PBL in K-12 (Australia, China, Korea, Malaysia, Singapore, or Costa Rica)

Related Research Activity There is a great deal of related research taking place in higher education and professional settings, as shown on the Problem Based Education SIG (2012) web site. We consider Common Core and performance assessment reforms to also be closely aligned with PBL.

APPENDICES

APPENDIX A:	DETAILED LIST OF PARTICIPANTS
APPENDIX B:	DETAILED BUDGET REQUEST
APPENDIX C:	REFERENCES
APPENDIX D:	BIOGRAPHICAL STATEMENTS (FOR LEADS) & LETTERS OF SUPPORT
APPENDIX E:	CURRICULUM VITAE for ORGANIZERS

Note. Appendices A-C are one (1) PDF file. Appendices D and E are provided as two (2) separate PDF files.

APPENDIX A: DETAILED LIST OF PARTICIPANTS (N = 76) by SITE (from surveys and contacts with leads)

State/Region	Number	Institutional Counts
Indiana	30	Purdue (10) *** University of Indianapolis-CELL (12) *** Indiana University-Bloomington (4) *** Indiana University-Purdue University Indianapolis (4) Indiana University-Purdue-Columbus (1)
Israel	10	Weizmann Institute of Science (3) *** Technion (2) Institute for Democratic Education (2) Tel Aviv University (2) Bar Ilan University (1)
California	7	New Tech Network (2) Independent Consultant (1) Mills College (1) San Jose State University (1) SRI International (1) Buck Institute for Education (1) ***
Other International	5	Scotland - University of Edinburgh (2) Germany - Ruhr University Bochum (1) Cyprus - CARDET - University of Nicosia (1) Canada - University of Toronto/OISE (1)
Minnesota	2	Hamline University (1) Minnesota State University-Mankato (1)
New Hampshire	2	University of New Hampshire (2)
North Carolina	2	North Carolina State University (2)
New York	2	New York Hall of Science Teachers College-Columbia University
Texas	2	New Tech Network (1) University of Texas at Austin (1)
Virginia	2	George Mason University (2)
Alabama	1	Auburn University
Colorado	1	University of Colorado-Boulder
Iowa	1	Iowa State University
Michigan	1	University of Michigan
New Jersey	1	Rutgers University
New Mexico	1	University of New Mexico
New York	2	New York Hall of Science Teachers College-Columbia University
North Dakota	1	University of North Dakota
Tennessee	1	University of Memphis
Utah	1	Utah State University
Washington	1	University of Washington

*** Indicates interest in hosting local meetings to help contribute online and prepare for the larger meetings

APPENDIX B. BUDGET

Category	AERA Meeting	Cost (N=30)	Indiana Meeting	Cost (N=30)	TOTAL
Reception	\$30 / person	\$900	\$30 / person	\$900	\$1,800
Pizza	Up to 6 sites (besides Indiana) @ \$50	\$300	\$100 Indianapolis \$50 Purdue \$50 IU-Bloomington	\$200	\$500
Meeting Room	Large multi-purpose room	\$1200	Large multi-purpose room reserved for October 12, 2012	No cost for facility use or parking, in-kind	\$1200
LCD Projector	One day @ \$120	\$120		N/A	\$120
Coffee break	2 breaks @ \$ 150	\$300	Crunch & munch coffee break @ \$3.50	\$105	\$450
Meals	Breakfast @ \$15 Lunch @ \$25 Dinner @ \$35	\$2,250	Healthy Breakfast Buffet @ \$6.75 Delux Deli Lunch Buffet @ \$8.00	\$442.50	\$2,692.50
Hotel	2 nights @ \$200	\$12,000	Holiday Inn near campus @ \$100	\$3000	\$15,000
Flights	4 (int'l) @ \$1000	\$4,000	2 @ \$500 Jason/Mary	\$1000	\$5000
Car Travel, Ground	Internationals Only 4 @ \$30 per	\$120	100 miles IU-B * 5 150 miles Purdue*5 15 miles IUPUI*1	@ \$.55 / mile \$695.75	\$814.75
Internet	Wireless connections for 30 people	\$2850	Yes	No cost, in-kind	\$2850
Reporter	1 day taking notes 1 day reporting	\$1000	N/A		\$1000
Photocopies	40 * 30 @ \$.05	\$60	N/A		\$60
Admin (BIE)					\$2,500
					\$33,988.25

In-Kind Contributions (est. \$8500) Buck Institute for Education (BIE) is providing in-kind services from Jason Ravitz and Mary English valued at approximately (\$5000) as well as photocopying and administrative expenses beyond those in the budget (valued at \$2500). Center of Excellence in Leadership of Learning (CELL) at University of Indianapolis will provide in-kind contribution for the use of the room for the Indianapolis meeting and administrative support, estimated at \$600. Weizmann Institute in Israel will contribute rental of conference room and equipment at \$400.

APPENDIX C. REFERENCES

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APPENDIX D: BIOGRAPHICAL STATEMENT FOR LEADS

Anthony Petrosino (Pre-service lead)

Dr. Petrosino is a graduate of Columbia University's Teachers College (MA, 1990) and received his PhD from Vanderbilt University (1998). He completed a post-doc at the University of Wisconsin where he was a member of the National Center for Improving Student Learning and Achievement in Mathematics and Science (NCISLA). In 1999 he accepted a Professorship at the University of Texas and received tenure in 2004. He holds the Elizabeth G. Gibb Endowed Fellowship in Mathematics Education. Dr. Petrosino has published over 20 peer reviewed journal articles, made over 100 national and international conference presentations and has supervised a dozen doctoral dissertations. He has received over 30 million dollars in grants from the National Science Foundation, the Department of Education and the McDonnell Foundation for Cognitive Studies. **He is a founding professor of the nationally recognized UTeach Natural Sciences preservice teacher education program.** From July 2007 to August 2009 he served as the Assistant to the Superintendent in the Hoboken School District.

Jill Bradley-Levine (Indiana Meeting lead)

Jill Bradley-Levine serves as CELL's Fellow for Research and Evaluation. In this position, she is lead researcher on various studies about project-based learning including New Tech high school implementation in Indiana, PBL coaching and professional development initiatives, PBL-focused teacher training programs, and PBL implementation in K-12 schools. In addition, Jill serves on the PBL Institute planning committee and the PBL certification committee in Indiana. She also utilizes PBL as an instructional approach for the graduate courses she teaches. She earned her doctorate in education policy studies with a concentration in educational leadership from Indiana University. Her other research interests are teacher leadership, education reform, action research, mixed-methods evaluation, and critical inquiry. Jill worked as a postdoctoral research fellow at the Center for Urban and Multicultural Education at Indiana University-Purdue University Indianapolis, and taught middle school and high school English for six years in Indiana and London, England, where she served as the literacy across the curriculum coordinator.

David Kanter (Informal Education lead)

David Kanter, Ph.D., joined the New York Hall of Science (NYSCI) in September of 2010 as the inaugural Director of the Sara Lee Schupf Family Center for Play, Science, and Technology Learning (SciPlay). SciPlay is an applied research center within the hands-on science museum that designs, develops, and studies environments, and curricula that harness the potential of play to enhance all students' understanding of and deeper engagement in science. Kanter joined NYSCI from Temple University where he was an Assistant Professor in Curriculum, Instruction and Technology in Education (Science Education) and in Biology. Kanter received Bachelor of Science degrees in Engineering and in Economics from the University of Pennsylvania, followed by a Ph.D. in Biomedical Engineering from the Johns Hopkins University School of Medicine. He then received a NSF fellowship for training Ph.D. scientists in science education research, which he completed in the Learning Sciences at Northwestern University. Kanter has led several federally-funded studies on technology-enhanced project-based science curriculum design, and the pre-service and in-service teacher preparation necessary to teach such curricula. His recent work has been published in the *Journal of Engineering Education*, *New Directions in Teaching and Learning*, and *Science Education*. Kanter's new National Science Foundation-funded projects include "SciGames: A Technology-enhanced Model for Bridging Informal and Formal Science Learning" and "GenetiGames: Investigating the Capacity of Game-based Design Elements to Enhance Affective Dimensions of Genetics Learning."

Tom Brush (Social studies lead)

Tom Brush is Professor and Associate Dean for Teacher Education at the School of Education, University of Indiana-Bloomington. His research goals concern design of methods and strategies for promoting inquiry-oriented learning in open-ended instruction and methods for integrating tools to promote cooperative, collaborative, and problem-based learning strategies. He has worked on a major project with John Saye at Auburn University on the Persistent Issues in History Network, which includes a set of web-based tools and resources designed to support history teachers interested in implementing problem-based inquiry strategies in their classrooms. Visit <http://pihnet.org> for more information. He also is focused on helping pre-service teachers acquire the skills and experiences needed to effectively utilize technology. This includes a current research project on preparing future teachers to integrate technology into teaching and learning activities. He is Project Director of a \$750,000 FIPSE grant with colleagues Auburn University and New Mexico State University called "PBL-TECH: Using Web 2.0 Tools and Resources to Support Problem-Based Curricular Innovations in Pre-Service Teacher Education". The purpose is to design, disseminate, evaluate, and sustain an enhanced teacher preparation model using Web-based tools and resources to teach future teachers to effectively implement innovative technology-supported problem-based learning (PBL). The project focuses on five overall outcomes: 1) identify and/or develop a set of Web-based tools and resources to support technology-enhanced PBL activities in teacher education; 2) increase the ability of teacher educators to model the use of Web 2.0 tools to facilitate PBL strategies with their pre-service teachers; 3) increase the ability of pre-service teachers to utilize Web 2.0 tools to facilitate PBL strategies in their future classrooms; 4) facilitate the dissemination and utilization of project resources and strategies to teacher education institutions; and 5) sustain and maintain project activities at initial partner institutions.

Peg Ertmer (Dissemination Lead)

Dr. Peg Ertmer is a professor in Learning Design and Technology in the College of Education at Purdue University. Her scholarship focuses on the impact of student-centered instructional approaches and strategies on student learning. She has examined the impact of problem- and case-based instruction on higher-order thinking skills; the adoption of student-centered, problem-based learning approaches by K-12 teachers; and strategies for facilitating higher-order thinking in problem- and case-based learning environments. Dr. Ertmer is the founding editor of the *Interdisciplinary Journal of Problem-based Learning*, an open-access, online journal, dedicated to publishing rigorous scholarship devoted to research and practice on problem-based learning. She was a faculty consultant on a 5-year DOE Technology Innovation Challenge Grant (1999-2005), partnering with Crawfordsville Community Schools and Indianapolis Public Schools to integrate one-on-one laptop programs within a PBL pedagogical approach. Currently, as part of an NSF I-3 Grant, Professor Ertmer teaches an intensive 2-week summer workshop, which uses a project-based approach, to help pre-service and in-service teachers learn to use project- or problem-based methods in their rural high school and middle school classrooms. In addition, she has consulted with the Attica school corporation in Indiana, The National College of Ireland in Dublin, Ireland, and the John Scottus Secondary School in Dublin to help teachers develop and implement PBL units in their classrooms.

Sherman Rosenfeld (Israel Lead)

Dr. Sherman Rosenfeld is a biologist and science educator who has designed, implemented and evaluated innovative science and technology educational programs, both inside and outside schools. Since 1982, shortly after he received his PhD from the SESAME Program at UC Berkeley, he has worked as a science educator at the Weizmann Institute of Science, throughout Israel and internationally. His work focuses on promoting constructive change with students, teachers, schools and learning communities. He directed an interactive science museum in California, designed award-winning educational software, developed curricula for pre-college students and prepared hundreds of Israeli middle school science teachers to guide their students to engage in research and development projects. Rosenfeld has spearheaded a national effort to integrate student Project-Based Learning into secondary schools, by developing PBL curricula, implementing a long-term professional development model, conducting educational research and chairing a national committee devoted to this goal.

LETTERS OF SUPPORT



1400 East Hanna Avenue | (317) 788-3777
Indianapolis, Indiana 46227 | (317) 791-5925 fax
<http://cell.uindy.edu>

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February 14, 2012 ¶

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To whom it may concern, ¶

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The Center of Excellence in Leadership of Learning (CELL) supports Jason Ravitz of the Buck Institute for Education's proposal to the American Educational Research Association for a Project-based Learning research conference to be held in Indiana on the campus of the University of Indianapolis. On behalf of CELL, I have reviewed the proposal and will work in collaboration with Dr. Ravitz to plan the Indiana regional PBL conference. ¶

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Sincerely, ¶

¶

Jill Bradley-Levine ¶

Fellow for Research and Evaluation ¶

¶

February 14, 2012

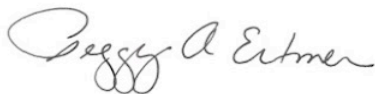
Jason Ravitz, Director of Research
Buck Institute for Education

Dear Jason,

I'm pleased to express my support for your AERA Research Conference Grant Proposal: PBL in K-12 Research. As the founding and current editor of the *Interdisciplinary Journal of Problem-based Learning (IJPBL)*, I am keenly aware of the importance of this pedagogical approach as well as the ongoing need for rigorous research to support the development, implementation, and assessment of its benefits and shortcomings. Although PBL has made inroads into K-12 contexts, especially in recent years, those who wish to assess its impact within their own settings tend to have to re-invent the wheel, as the mechanisms for sharing proven methods and results are nearly nonexistent. The proposed AERA pre-conference gathering of research experts in this area is an ideal way to build capacity and to coordinate efforts to reach our shared goal of improved teaching and learning in the K-12 schools.

As the editor of IJPBL, I have a strong understanding of the importance of disseminating information and resources to a community of scholars, all invested in a specific research area. IJPBL is a perfect outlet for the scholarship that results from the gathering of K-12-focused PBL researchers; we look forward to publishing a strand of papers, over a series of issues, that grow out of this meeting. I'm pleased to support this proposal and share my expertise related to the dissemination of problem- and project-based learning research findings. Only by joining forces, can we expect to build the strong collaborative foundation required to ramp up and disseminate research efforts directed toward improved PBL knowledge and practice in K-12 contexts.

Respectfully submitted,



Peggy A. Ertmer, PhD
Professor of Learning Design and Technology
Editor, Interdisciplinary Journal of Problem-based Learning
Purdue University

College of Education

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INDIANA UNIVERSITY

SCHOOL OF EDUCATION

Office of Teacher Education
Bloomington

February 15, 2012

To Whom It May Concern:

I am writing this letter in strong support of the AERA Research Conference grant proposal entitled "PBL in K-12 Research" that is being submitted by Jason Ravitz and the Buck Institute for Education. Having participated in research in this area for over 15 years, I believe that this conference will be an exciting opportunity for members of the research community to share our knowledge and expand the possibilities of future research collaborations related to the use of PBL in K-12 contexts.

If funded, I will provide my full support towards making the conference a success. I will facilitate conference planning sessions in Indiana, as well as serve as a conference facilitator and presenter during the conference. I will also request that graduate students and faculty at Indiana University who are currently working with me in this area of research participate in conference planning and implementation as well.

I urge you to give this proposal serious consideration. I believe the conference will provide a major opportunity for researchers in PBL to expand and extend our research efforts. Thank you for your consideration.

Sincerely,

A handwritten signature in blue ink that reads "Thomas Brush". The signature is fluid and cursive, with the first and last names being clearly legible.

Thomas Brush
Barbara B. Jacobs Chair in Education and Technology
Indiana University, Bloomington



To Whom It May Concern,

I strongly recommend that AERA accepts the proposal being submitted by Dr. Jason Ravitz. As someone who has been involved with PBL in Israel for over 20 years -- in practice, professional development and educational research -- I think that the value of such an initiative cannot be overestimated.

There is sound research evidence that PBL-related pedagogies can lead to meaningful learning and help students develop valuable lifelong-learning skills which are appropriate for the 21st Century. However, in both the United States and Israel, these pedagogies are still considered marginal, on the national levels. While examples of good practice regarding these pedagogies exist for specific disciplines, schools and districts, the overall picture is that they are not mainstream on the educational scene.

One way to encourage the practice of PBL would be to create and implement a comprehensive PBL research agenda, which is responsive to the needs and concerns of the educational scene. This research agenda would include student reactions to PBL, the perceived costs and benefits of PBL by different educational stakeholders (and which best practices can address the former), models for effective pre-service and in-service teacher programs, whole-school change (including the professional development of school principals), and issues relating to scaling up PBL to the regional and national levels.

I have a strong sense that creating and implementing a comprehensive PBL research agenda in Israel would go a long way to help develop more support for PBL practices in this country. For this reason, the proposal stands to help us a great deal. One of the proposal's goals is to promote collaboration between American and Israeli PBL researchers.

The Israeli researchers include at least 5 researchers who have contributed to the research literature on PBL, as well as about 5 masters students and about 5 doctoral students who are doing work on topics relating to PBL (the list attached to the appendix, listing 10 researchers from 5 different institutions, is currently incomplete). Connecting the Israeli PBL researchers with like-minded American researchers could give a real boost to PBL-related research in this country.

In addition, I believe that not only will Israeli researchers benefit from their contacts with American researchers, but vice versa. One of the areas in which Israel has some research expertise is in the area of CPD (Continuous Professional Development) as it relates to PBL. In addition, we are currently in the midst of a national effort, coordinated by the Pedagogical Secretariat of the Ministry of Education, to merge "top-down" approaches with "bottom-up" approaches relating to PBL in schools. We are more than willing to share this experience with others.

Sincerely,

Sherman Rosenfeld, Ph.D
Department of Science Teaching
Weizmann Institute of Science
Rehovot, Israel 76100



COLLEGE OF EDUCATION

THE UNIVERSITY OF TEXAS AT AUSTIN

Department of Curriculum and Instruction • Austin, Texas 78712-1294
(512) 471-5942 • FAX (512) 471-8460

February 15, 2012

Dear Dr. Ravitz,

Thank you for your invitation to participate in your AERA Research Conference Grant Proposal for a PBL in K-12 Research Conference. I have read your proposal and believe it is timely and exciting and will bring together many of the leading names in PBL research and practice in the field.

I will be pleased to discuss the UTeach Natural Sciences Program which has a Project Based Instruction course as one of the 3 primary courses all students take from the College of Education at The University of Texas at Austin. In addition, I plan on speaking about replication efforts for UTeach PBI at over 30 universities and colleges from around the country.

In the course, students aim to master new technologies for problem-based investigations in math and science classrooms, teaching project-based lessons to middle school students. Students also discuss the use of assessment to improve student learning. The field component includes 2 observation days and 3 teaching days.

I will also be more than happy to discuss research findings from ongoing research I have been conducting on the longitudinal aspects of student teachers as they transition to school based setting.

Sincerely,

Anthony J. Petrosino, Ph.D.
Associate Professor
Elizabeth G. Gibb Endowed Fellow
Department of Curriculum and Instruction
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1 University Station, Mail Stop D5700
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